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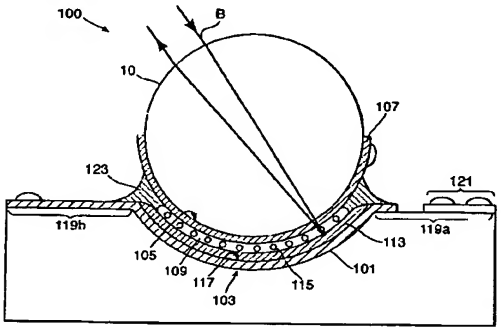
(54) Title: RETROREFLECTIVE DEVICES AND SYSTEMS



(57) Abstract: This invention relates to retroreflective devices and systems incorporating such devices; the term "retroreflective devices" as used herein being intended to encompass generally optical components used for returning radiation automatically from a remote location toward an optical source. In one aspect, an embodiment of the invention is a retroreflective device comprising a lens having a non-planar outer surface; and a liquid crystal cell having a non-planar layer comprising liquid crystal material, said non-planar layer having a shape corresponding with that of the non-planar outer surface of the lens. The device includes a reflective part arranged to retroreflect a radiation beam passing through the lens, and the liquid crystal cell is arranged to modulate one or more characteristics of said retroreflected radiation beam. Embodiments of the invention are advantageous for use in applications that require thin, transmissive modulators that are compatible with non-planar retroreflecting devices. Liquid crystals offer a useful modulation action for optical path lengths of 1 mm and less, and, since the local orientation of their molecular symmetry axes can be controlled by the fabrication process so as to vary with position, they can be made to be locally optimum over the whole of the reflecting surface of the non-planar retroreflecting device. In addition, liquid crystal devices are associated with low power requirements, which make them advantageous for use in power-limited applications.

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